

JP 3-294239

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<p>92:051990/07 A41 E17 JAPC 11.04:90  NIPPON SHOKUBAI CO LTD *JO 3294-239-A  11.04.90-JP-094069 (25.12.91) B01j-23/88 B01j-27/18 C07b-61  C07c-45/35 C07c-47/22 C07c-57/05 C07c-271/14  Acrolein and acrylic acid prepn. in higher yield - by gas phase oxidn.  of propylene with molecular oxygen over multilayer catalyst bed  C92-023098</p>	<p>A(1-D5, 1-D8) E(10-C4G, 10-D1A) N(1, 2-A, 2-B, 2-C, 3, 4-A, 4-B)  E = One or more of Si, Al, Ti and Zr, and  a, - i and x = Atomic ratios, a = 12, b = 0-10, c = 1-10,  d = 0.1-20, e = 2-20, f = 0-10, g = 0.001-10,  h = 0-4, i = 0-30, x is determined on other  elements valencies.</p>
<p>Prepn. of acrolein (I) and acrylic acid comprises gaseous  phase catalytic oxidation of propylene with molecular oxygen  over a complex oxide catalyst of formula (II)  Multi-pipe reactor is used. Catalysts are packed into  individual pipes of the reactor to fine layers in order of  activity from low to high in axis direction of pipe from  inlet to outlet of material gas to prepare a fixed catalyst  bed.  <math display="block">\text{Mo}_a \text{W}_b \text{Bi}_c \text{Fe}_d \text{Al}_e \text{Ti}_f \text{Zr}_g \text{Si}_h \text{O}_x</math> (II)  A = Ni and/or Co,  B = One or more alkali metal thallium,  C = One or more of alkali earth metal(s),  D = One or more of P, Te, Sb, Sn, Ce, Pb, Nb, Mn, As  and Zn.</p>	<p><b>ADVANTAGE</b>  Local overheat of catalyst bed can be avoided. (II)  shows high activity for a long period, and (I) is prepd. in  higher and more steady yield than prior arts.  <b>PREFERRED CONDITIONS</b>  The material gas comprising propylene 1-10 vol%,  molecular oxygen 3-20 vol%, steam 0-60 vol%, and inert gas  20-80 vol% is fed to the reactor at SV 300-5,000 hr<sup>-1</sup>. The  reaction of propylene with molecular oxygen is carried out  250-450°C under ordinary pressure to 10 kg/sq.cm.  <b>EXAMPLE</b>  Catalyst A (Mo<sub>12</sub>W<sub>2</sub>Bi<sub>1</sub>Fe<sub>1</sub>Co<sub>1</sub>Ni<sub>2</sub>Cs<sub>0.06</sub>Ba<sub>0.1</sub>Si<sub>1.35</sub>, 750ml)  and catalyst B (Mo<sub>12</sub>W<sub>2</sub>Bi<sub>1</sub>Fe<sub>1</sub>Co<sub>1</sub>Ni<sub>2</sub>Cs<sub>0.06</sub>Ba<sub>0.1</sub>Si<sub>1.35</sub>, 750 ml)  were packed into pipe reactor (25.4mm φ) to prepare a  fixed catalyst bed. The catalyst bed was heated at 310°C.  JO3294239-A+</p>

mixt. of propylene 8 vol%, molecular oxygen 14.1 vol%, steam  
25 vol% and nitrogen 52.9 vol% was fed to the reactor at SV  
1,600 hr<sup>-1</sup>. Conversion of propylene was 97.8%, and  
selectivity coefficient of (I), acrylic acid was 86.6%, 9.7%,  
resp. (8ppW129HWDwgNo0/0)

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